Engineering, Compliance & Construction, Inc.

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January 16, 2009

Mr. Siew Low
Air Division
Arkansas Department of Environmental Quality
5301 Northshore Drive
North Little Rock, AR 72118-5317

RE: CenterPoint Energy - Dunn Compressor Station
Permit 1209-AOP-2, AFIN: 42-00088
PVMRM Modeling Protocol

Dear Mr. Low,

ECCI, on behalf of CenterPoint Energy Gas Transmission (CEGT) is pleased to submit the attached revised Plume Volume Molar Ratio Method (PVMRM) modeling protocol for the above-referenced facility. ECCI and CEGT also appreciate you taking the time to meet with us on January 14, 2009 to discuss the additional items in your letter dated December 15, 2008.

Attached with this letter are copies of the modeling protocol and a CD containing the stack testing report performed for this facility to demonstrate the in-stack ratios. If you have any questions or need additional information, please do not hesitate to contact me at (501) 663-8247.

Sincerely,
ECCI

Shannon G. Lynn, P.E.
Senior Project Manager

cc: Mr. Erik Snyder - US EPA Region VI
Ms. Lacey Ivey - CEGT
Ms. Laura Guthrie - CEGT

AMBIENT AIR QUALITY ANALYSIS PROTOCOL

An applicant for a Title V Operating permit is required to conduct an air quality analysis of the ambient impacts associated with existing sources and the construction and operation of proposed new sources. Initial dispersion modeling analyses for CenterPoint Energy Gas Transmission Company's (CEGT) Dunn Compressor Station were performed by the Arkansas Department of Environmental Quality's Air Division (ADEQ) in accordance with their Screening Protocol. The model is used to determine if emissions from the CEGT - Dunn Compressor Station facility would cause or contribute to a violation of any applicable National Ambient Air Quality Standards (NAAQS) or create an issue with the ADEQ's Non-Criteria Pollutant Control Strategy (NCPCS). NAAQS analyses were performed for the criteria pollutants of particulate matter (PM_{10}), carbon monoxide (CO), sulfur dioxide (SO_2) and nitrogen oxides (NO_x). NO_x will require additional review. The following describes the protocol proposed for use by CEGT - Dunn Compressor Station.

Control Options

Modeling will be performed in accordance with an EPA approved model. The dispersion modeling will be performed using the latest version of the personal computer software version of the AERMOD model. This version includes a "Regulatory Default Option" that automatically selects appropriate wind profile exponents and other model parameters.

Since NO_x modeling did not meet the NAAQS, additional modeling is required. The "Regulatory Default Option" will be turned off for the refined NO_x analysis since ozone limiting will be used. The "Non-Default Option" of "Ozone Modeling" will be selected. The remainder of this protocol will discuss the methodology used to model NO_x emissions from the CEGT - Dunn Compressor Station.

The model has rural and urban modes that affect wind profile exponents, dispersion rates, and mixing heights used in the computation. The Rural Mode will be selected based on land use in the area. As a side note, in a meeting with ADEQ personnel (Mr. Siew Low, Ms. Karen Cerney and Mr. Charles Hurt) on January 14, 2009, the ADEQ indicated that the entire state of Arkansas has been designated as rural for modeling purposes.

Meteorological Data

The AERMOD model will be executed using a single year of meteorological data, 2006. The surface data was taken from Fort Smith, Arkansas (Station ID 13964) and the upper air data was taken from Little Rock, Arkansas (Station ID 03952). This data was processed with AERMET for use in AERMOD using parameters specified by the ADEQ. The meteorological data analyze the air impact of joint frequency distribution of wind direction, wind speed, and atmospheric stability classes.

Terrain Data

Digital terrain files identified by the AERMAP pre-processor will be utilized for terrain and surface characteristics. Four (4) 7.5 minute terrain files were identified and will be implemented. These include Blue Mountain, Magazine, Paris and Caulksville. The .DEM files are all readily available for download at www.webgis.com.

Receptor Grid

The AERMOD model will be set to use discrete Cartesian receptors. Discrete Cartesian grid receptors will be placed at 50 meter intervals along the facility fence line. Discrete Cartesian receptors will also be used to form a 50 meter grid from the fence line to a distance equivalent to 500 meters. No long range transport impacts are expected due to the low stack heights of the sources to be modeled.

Emission Data / Sources

Emission data is based on the potential to emit design rates. All sources emitting NO_x will included in the model. The following is an inventory of those sources.

Source ID	Source Description	Height (ft)	Temp (°F)	NO_2/NO_x In-Stack Ratio	Emission Rate (lbs/hr)
SN-01	Compressor Engine	30.8	391.1	0.1997	70.5
SN-02	Compressor Engine	39.3	368.9	0.2313	202.3
SN-03	Compressor Engine	39.3	368.9	Not tested	202.3
SN-04	Compressor Engine	39.3	368.9	0.2450	202.3
SN-05	Turbine	14.0	462.8	Not tested	3.5
SN-06	Turbine	14.0	451.1	Not tested	3.5
SN-08	Generator Engine	15.0	260.0	Not tested	0.3
SN-35	Air Compressor	15.0	537.8	Not tested	0.2

Good Engineering Practice Stack Height

The Building Profile Input Program (BPIP) will be used to incorporate building characteristics within CEGT - Dunn Compressor Station's property into the model. These will be evaluated in terms of their proximity to nearby sources. The purpose of this evaluation is to determine if the stack discharge may become caught in the turbulent wake of the structures, leading to downwash of the plume and possible high-level concentrations in the vicinity of an emission source.

NO_2 Tiered Approach

Tier 1

Nitrogen dioxide (NO_2) modeling was conducted in a tiered approach based on the Guidance on Air Quality Models (GAQM) located at 40 CFR 51 Appendix W, Section 5.2.4. The guidance outlines methods for modeling NO_x/NO_2 emissions for compliance purposes. The first model that was executed used the Tier 1, unadjusted NO_x emission rates from the permit calculations. The output of this model indicated an annual concentration of 306 $\mu g/m^3$.

Tier 2

For the next level, Tier 2, the results from the Tier 1 analysis are multiplied by an empirically derived NO_2/NO_x national default ratio of 0.75. This also exceeds the NO_2 NAAQS.

Tier 3

This protocol will address the Tier 3 approach while using ozone limiting methods. The Plume Volume Molar Ratio Method (PVMRM) Ozone Limiting Method (OLM) is proposed for use. This method has also been used and approved for several projects by the Alaska Department of Environmental Conservation (ADEC) and EPA Region X.

In-Stack NO_2/NO_x Ratio

The default in-stack NO_2/NO_x ratio for the AERMOD-PVMRM model is stated to be 0.10 or 10 percent in the US EPA AERMOD Users Guide. This value has been used for large power generation facilities and power plants.

Based on initial discussions with the ADEQ and Mr. Erik Snyder of US EPA Region VI, it was suggested that the maximum stack tested in-stack ratio be used. This will be rounded up to 0.25 based on SN-04 from the table above.

In discussions with US EPA Region X (Mr. Herman Wong) and ADEC (Mr. Alan Schuler), both agencies have expressed a significant interest in additional in-stack ratio data for compressor engines and turbines in the size category. Both agencies are confident that additional data such as this will be instrumental in adopting the PVMRM as a regulatory default.

Equilibrium NO_2/NO_x Ratio

The default equilibrium ratio of NO_2/NO_x used in the AERMOD-PVMRM model is 0.90 or 90 percent, as taken from the US EPA AERMOD User's Guide. In a letter dated December 15, 2008, the ADEQ requested a detailed ambient monitoring protocol for NO_x/NO_2 based on the following statement,

"With equilibrium ratio used in the PVMRM modeling, the Department and EPA have decided to require at least 2 years of monitoring as an assessment of the equilibrium ratio. No less than two ambient air monitors around Dunn Compressor Station will be required for this assessment."

In a meeting with the ADEQ on January 14, 2009, ECCI and CEGT met with the ADEQ to discuss this requirement. ADEQ indicated that the requirement was at the request of US EPA Region VI and not by ADEQ.

ECCI contacted the ADEC on January 15, 2009 to inquire if ADEC and/or US EPA Region X had required ambient monitoring for any of the permits drafted and/or issued that had used PVMRM for demonstrating NO_x compliance. Mr. Alan Schuler of the ADEC indicated that none of the facilities that were approved for PVMRM were required to perform ambient monitoring. CEGT respectfully requests that this requirement by waived for the following explanation.

Since the maximum offsite impact is expected to occur within the immediate vicinity of the facility fenceline, the equilibrium ratio will have little to no effect on the model output. As proposed in the January 14, 2009 meeting, CEGT would use an equilibrium ratio of 1.0.

Background Ozone Concentration

It was initially proposed that a constant, conservative ozone background value of 80 parts per billion (ppb) would be used. However, based on phone conversations with Mr. Erik Snyder of US EPA Region VI, it was recommended that a constant ozone background value of 40 part per billion (ppb). In a letter received from ADEQ dated December 15, 2008, the Department proposed using data from the nearest ozone monitor which would be the monitor located near Mena, Arkansas. Reviewing the monitor values from http://www.epa.gov/air/data/repsst.html?st~AR~Arkansas, it appears that the maximum values are between 80 and 82 ppb. It is ECCI's experience that the higher the background ozone, the lower the modeled ambient impact.